



# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

( v ) Preliminary Specification

( ) Final Specification

|            |                     |
|------------|---------------------|
| Module     | 24.0" Color TFT-LCD |
| Model Name | M240HTN01.0         |

|                                                               |       |
|---------------------------------------------------------------|-------|
| Customer                                                      | Date  |
| _____                                                         | _____ |
| Approved by                                                   |       |
| _____                                                         | _____ |
| Note: This Specification is subject to change without notice. |       |

|                                                              |            |
|--------------------------------------------------------------|------------|
| Approved by                                                  | Date       |
| Howard Lee                                                   | _____      |
| Prepared by                                                  |            |
| Phoebe chen                                                  | 2012/11/07 |
| Desktop Display Business Group /<br>AU Optronics Corporation |            |



# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## Content

|           |                                     |           |
|-----------|-------------------------------------|-----------|
| <b>1</b>  | <b>HANDLING PRECAUTIONS</b>         | <b>4</b>  |
| <b>2</b>  | <b>GENERAL DESCRIPTION</b>          | <b>5</b>  |
| 2.1       | Display Characteristics             | 5         |
| 2.2       | Optical Characteristics             | 6         |
| <b>3</b>  | <b>FUNCTIONAL BLOCK DIAGRAM</b>     | <b>10</b> |
| <b>4</b>  | <b>ABSOLUTE MAXIMUM RATINGS</b>     | <b>11</b> |
| 4.1       | TFT LCD Module                      | 11        |
| 4.2       | Absolute Ratings of Environment     | 11        |
| <b>5</b>  | <b>ELECTRICAL CHARACTERISTICS</b>   | <b>12</b> |
| 5.1       | TFT LCD Module                      | 12        |
| 5.1.1     | Power Specification                 | 12        |
| 5.1.2     | Signal Electrical Characteristics   | 13        |
| <b>6</b>  | <b>SIGNAL CHARACTERISTICS</b>       | <b>15</b> |
| 6.1       | Pixel Format Definition             | 15        |
| 6.2       | Input Data Format Definition        | 15        |
| 6.3       | Signal Description                  | 16        |
| 6.4       | Timing Characteristics              | 17        |
| 6.5       | Timing Diagram                      | 18        |
| 6.6       | Power ON/OFF Sequence               | 19        |
| <b>7</b>  | <b>CONNECTOR AND PIN ASSIGNMENT</b> | <b>20</b> |
| 7.1       | TFT LCD Module                      | 20        |
| 7.1.1     | Pin Assignment                      | 20        |
| <b>8</b>  | <b>RELIABILITY TEST</b>             | <b>21</b> |
| <b>9</b>  | <b>MECHANICAL CHARACTERISTICS</b>   | <b>22</b> |
| <b>10</b> | <b>PACKING SPECIFICATION</b>        | <b>23</b> |
| 10.1      | Packing Flow                        | 23        |
| 10.2      | Pallet and Shipment Information     | 24        |



# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## Records of Revision

| Version and Date | Page | Old description | New Description | Remark |
|------------------|------|-----------------|-----------------|--------|
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |
|                  |      |                 |                 |        |



## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### 1 Handling Precautions

- 1) Since front polarizer is easily damaged, pay attention not to scratch it.
- 2) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 3) When the cell surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 4) Since the cell is made of glass, it may break or crack if dropped or bumped on hard surface.
- 5) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
- 6) Do not press or pat the panel surface by fingers, hand or tooling.
- 7) Please handle TFT cell with care. The FPCs can only sustain for quite limited stress.
- 8) The cell package tray is packed in clean room. Please do pack & unpack it in clean room.
- 9) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT cell.
- 10) Pls avoid touching COF position while you are doing mechanical design.
- 11) When storing modules as spares for a long time, the following precaution is necessary:  
Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.



# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## 2 General Description

This specification applies to the 24 inch-FHD color a-Si TFT-LCD Module M240HTN01.2. The display supports the FHD - 1920(H) x 1080(V) screen format and 16.7M colors (RGB 6-bit + Hi-FRC data). All input signals are 2-channel LVDS interface and this module doesn't contain a driver for backlight.

### 2.1 Display Characteristics

The following items are characteristics summary on the table under 25°C condition:

| Items                                    | Unit   | Specification                                              |                             |
|------------------------------------------|--------|------------------------------------------------------------|-----------------------------|
| Screen Diagonal                          | [mm]   | 609.7 (24.0")                                              |                             |
| Active Area                              | [mm]   | 531.36 (H) x 298.89 (V)                                    |                             |
| Pixels H x V                             |        | 1920(x3) x 1080                                            |                             |
| Pixel Pitch                              | [um]   | 276.75 (per one triad) ×276.75                             |                             |
| Pixel Arrangement                        |        | R.G.B. Vertical Stripe                                     |                             |
| Display Mode                             |        | TN Mode, Normally White                                    |                             |
| Optical Response Time                    | [msec] | 5ms (Typ., on/off)                                         |                             |
| Nominal Input Voltage VDD                | [Volt] | + 5.0 V                                                    |                             |
| Power Consumption<br>(VDD line+LED line) | [Watt] | TBD<br>Without LED BL, All black pattern at 60Hz           |                             |
| Weight                                   | [g]    | TBD                                                        |                             |
| Electrical Interface                     |        | Dual channel LVDS                                          |                             |
| Support Color                            |        | 16.7M colors (RGB 6-bit + Hi_FRC)                          |                             |
| Surface Treatment                        |        | Anti-Glare, 3H                                             |                             |
| Cell transmittance                       |        | 5.4% (Typ.)                                                | (base on AUO LED Backlight) |
|                                          |        | 4.59%(min)                                                 |                             |
| Cell thickness                           | [mm]   | 1.5 (the thickness of polarizer film is 0.25 mm each side) |                             |



## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

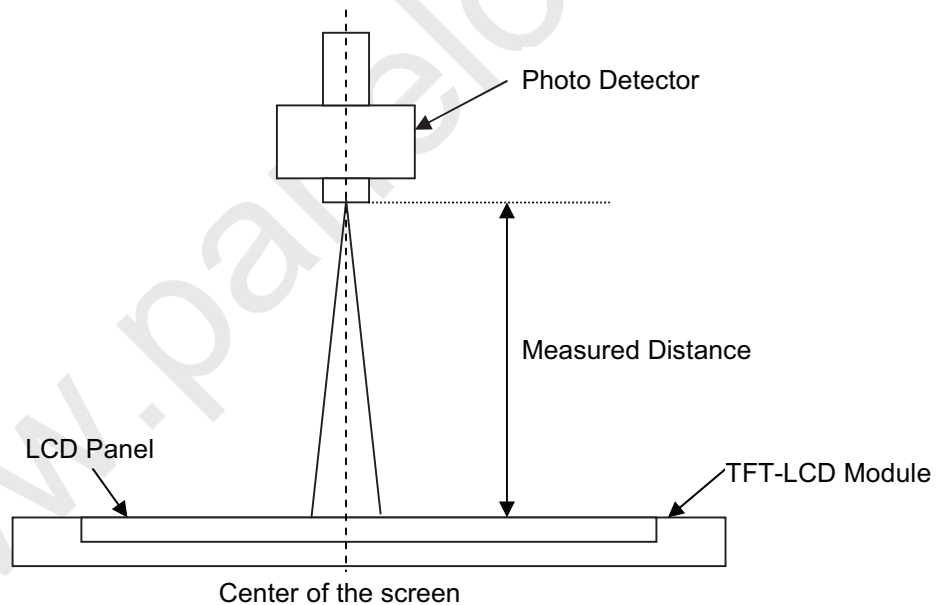
### 2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25°C:

| Item                | Unit   | Conditions         | Min. | Typ. | Max. | Note |
|---------------------|--------|--------------------|------|------|------|------|
| Response Time       | [msec] | Rising Time (TrR)  | -    | 3.5  | 7.4  | 4    |
|                     |        | Falling Time (TrF) | -    | 1.5  | 2.6  |      |
|                     |        | Rising + Falling   | -    | 5    | 10   |      |
| Crosstalk (in 60Hz) | [%]    |                    |      |      | 1.5  | 8    |
| Flicker             | dB     |                    |      |      | -20  | 9    |

#### Note 1: Measurement Method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring (at surface 35°C). In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.





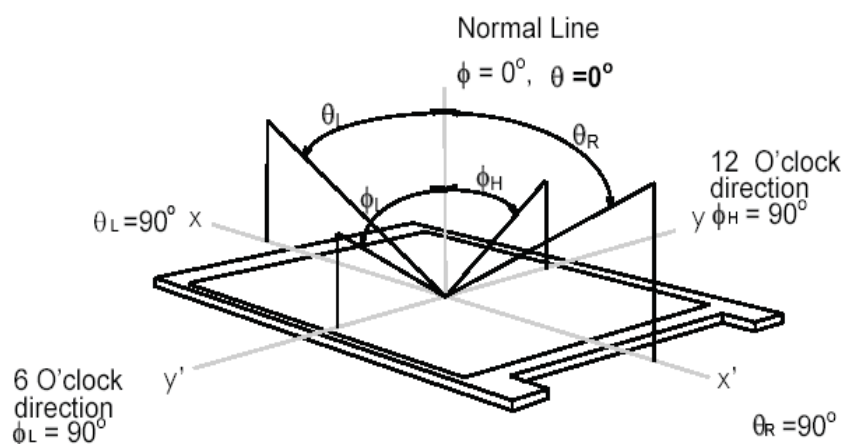
## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### Note 2: Definition of Viewing Angle measured by ELDIM (EZContrast 88)

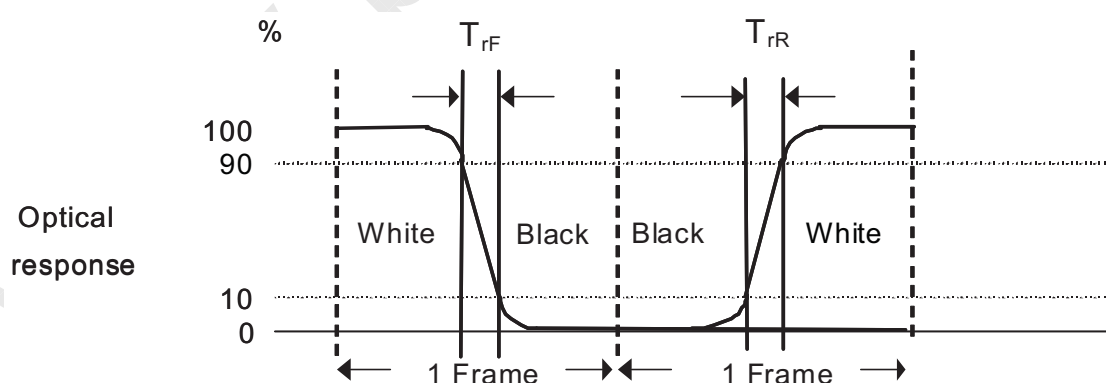
Viewing angle is the measurement of contrast ratio  $\geq 10$ , at the screen center, over a  $180^\circ$  horizontal and  $180^\circ$  vertical range (off-normal viewing angles). The  $180^\circ$  viewing angle range is broken down as follows;  $90^\circ$  ( $\theta$ ) horizontal left and right and  $90^\circ$  ( $\Phi$ ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



### Note 3: Contrast Ratio measured by TOPCON SR-3

### Note 4: Definition of Response time measured by Westar TRD-100A

The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full White" (rising time,  $T_{rR}$ ), and from "Full White" to "Full Black" (falling time,  $T_{rF}$ ), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.



$$T_{rR} + T_{rF} = 5 \text{ msec (typ.)}$$

### Note 5: Color Chromaticity and Coordinates (CIE) measured by TOPCON SR-3

### Note 6: Central Luminance measured by TOPCON SR-3



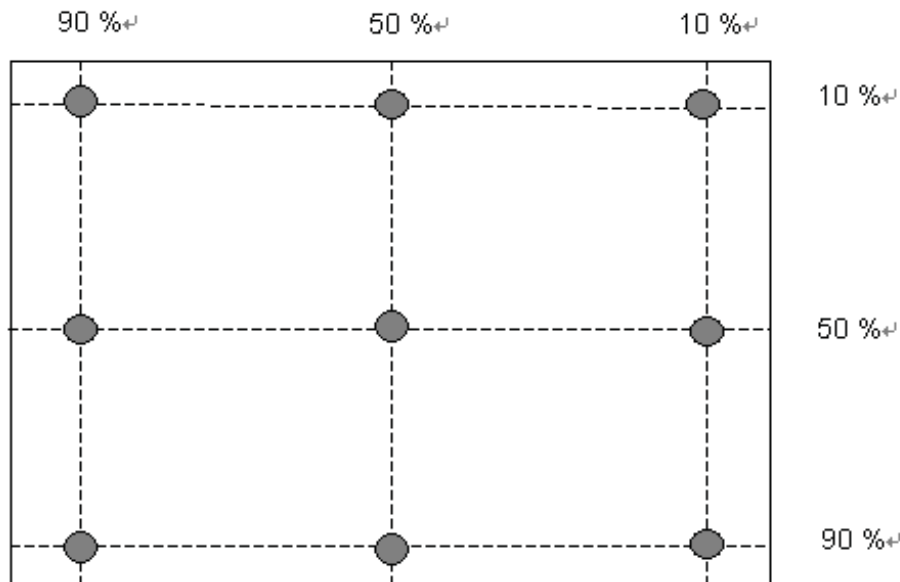


# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

**Note 7: Luminance Uniformity** of these 9 points defined as below and measured by TOPCON SR-3



$$\text{Uniformity} = \frac{\text{Minimum Luminance in 9 points (1 - 9)}}{\text{Maximum Luminance in 9 Points (1 - 9)}}$$

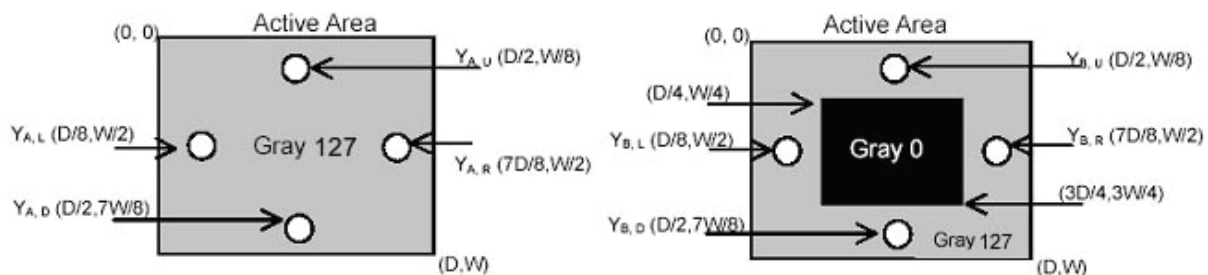
**Note 8: Crosstalk** defined as below and measured by TOPCON SR-3

$$\text{CT} = |Y_B - Y_A| / Y_A \times 100 (\%)$$

Where

Y<sub>A</sub> = Luminance of measured location without gray level 0 pattern (cd/m<sup>2</sup>)

Y<sub>B</sub> = Luminance of measured location with gray level 0 pattern (cd/m<sup>2</sup>)





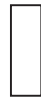
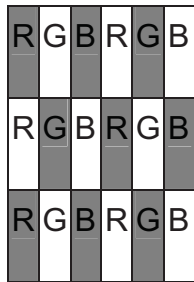


## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

**Note 9: Test Pattern Sub-checker Pattern** measured by TOPCON SR-3

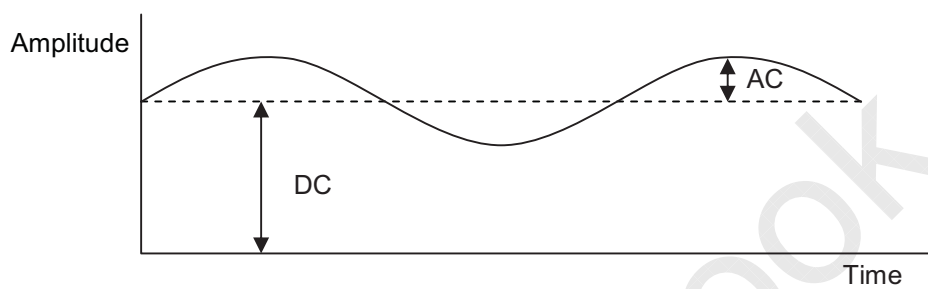


Gray Level = L127



Gray Level = L0

Method: Record dBV & DC value with TRD-100



$$\text{Flicker (dB)} = 20 \log \frac{\text{AC Level(at 30 Hz)}}{\text{DC Level}}$$



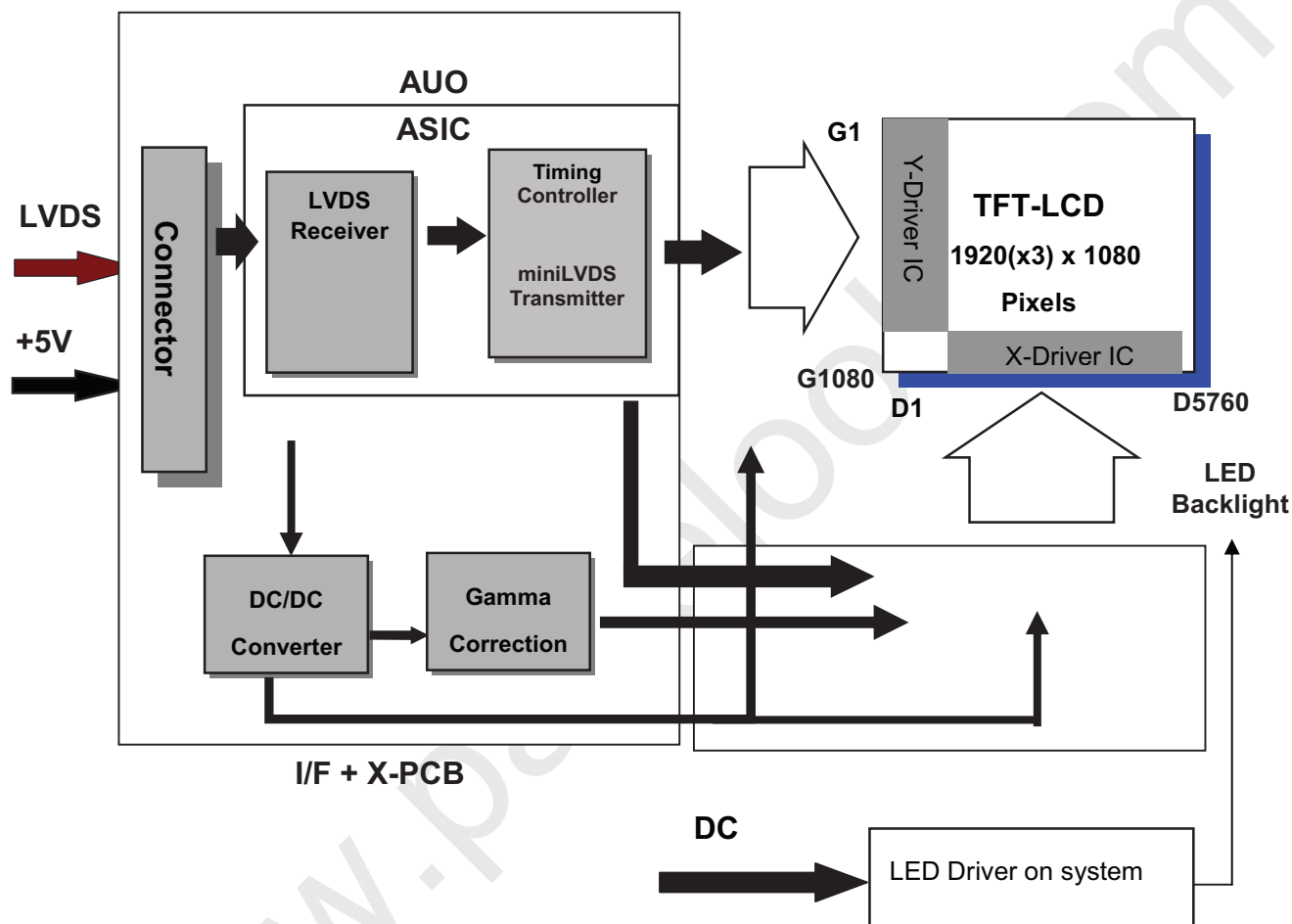
## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### 3 Functional Block Diagram

The following diagram shows the functional block of the 24.0 inch Color TFT-LCD Module:



#### I/F PCB Interface:

FI-XPB30SRLA-HF11  
01-187121-30091-3(A)  
MSCK2407P30

#### Mating Type:

FI-X30HL(Locked Type)



# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## 4 Absolute Maximum Ratings

Absolute maximum ratings of the module are listed as follows:

### 4.1 TFT LCD Module

| Item            | Symbol | Min | Max | Unit   | Conditions       |
|-----------------|--------|-----|-----|--------|------------------|
| Logic/LCD Drive | VDD    | 0   | 6.0 | [Volt] | <b>Note 1, 2</b> |

### 4.2 Absolute Ratings of Environment

| Item                                  | Symbol | Min. | Max. | Unit  | Conditions             |
|---------------------------------------|--------|------|------|-------|------------------------|
| Operating Temperature                 | TOP    | 0    | +50  | [°C]  | <b>Note 3</b>          |
| Glass Surface Temperature (Operation) | TGS    | 0    | +65  | [°C]  | <b>Note3<br/>Note4</b> |
| Operation Humidity                    | HOP    | 5    | 90   | [%RH] | <b>Note 3</b>          |
| Storage Temperature                   | TST    | -20  | +60  | [°C]  |                        |
| Storage Humidity                      | HST    | 5    | 90   | [%RH] |                        |

**Note 1:** With in Ta (25 °C)

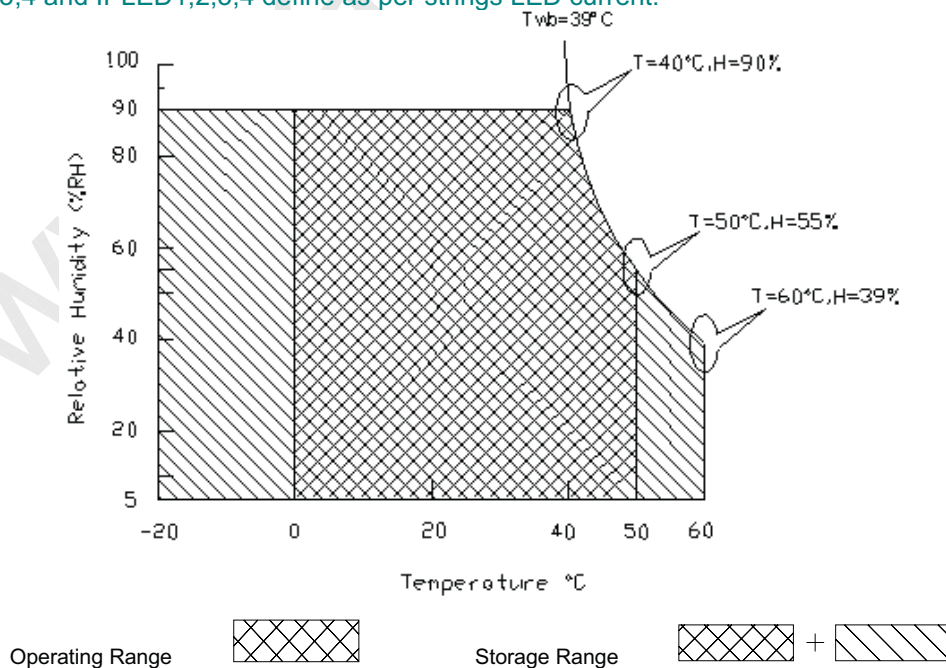
**Note 2:** Permanent damage to the device may occur if exceeding maximum values

**Note 3:** Temperature and relative humidity range are shown as the below figure.

1. 90% RH Max ( Ta ≤39°C)
2. Max wet-bulb temperature at 39°C or less. ( Ta ≤39°C)
3. No condensation

**Note 4:** Function Judged only

**Note 5:** IRLED1,2,3,4 and IPLED1,2,3,4 define as per strings LED current.





# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## 5 Electrical Characteristics

### 5.1 TFT LCD Module

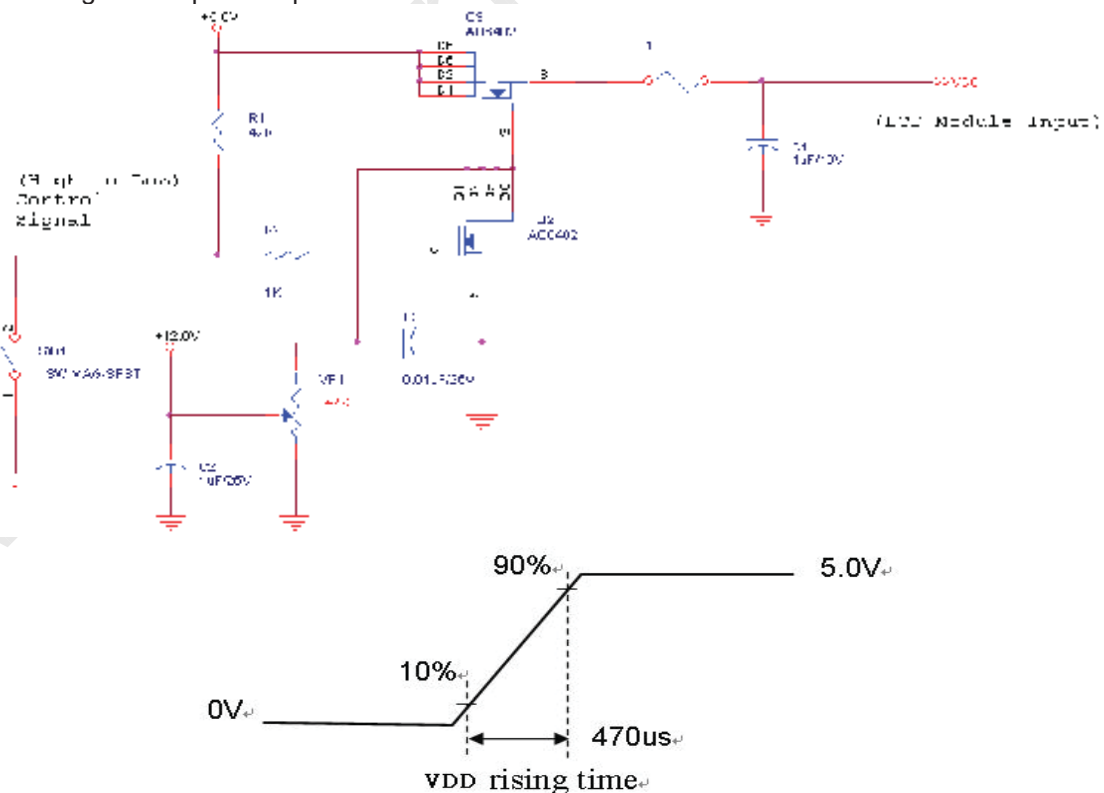
#### 5.1.1 Power Specification

Input power specifications are listed as follows:

| Symbol | Description                              | Min | Typ. | Max  | Unit     | Conditions                            |
|--------|------------------------------------------|-----|------|------|----------|---------------------------------------|
| VDD    | Logic/LCD Drive Voltage                  | 4.5 | 5.0  | 5.5  | [Volt]   | +/-10%                                |
| IDD1   | Input Current                            | -   | 0.65 | 0.78 | [A]      | VDD= 5.0V, All Black Pattern at 60 Hz |
|        |                                          | -   | 0.8  | 0.96 | [A]      | VDD= 5.0V, All Black Pattern at 75 Hz |
| PDD1   | VDD Power                                | -   | 3.25 | 3.9  | [Watt]   | VDD= 5.0V, All Black Pattern at 60 Hz |
|        |                                          | -   | 4    | 4.8  | [Watt]   | VDD= 5.0V, All Black Pattern at 75 Hz |
| IRush  | Inrush Current                           | -   | -    | 3    | [A]      | <b>Note 1</b>                         |
| VDDrp  | Allowable Logic/LCD Drive Ripple Voltage | -   | -    | 500  | [mV] p-p | VDD= 5.0V, All Black Pattern at 75 Hz |

#### Note 1: Measurement Conditions:

The duration of rising time of power input is 470  $\mu$ s.





# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

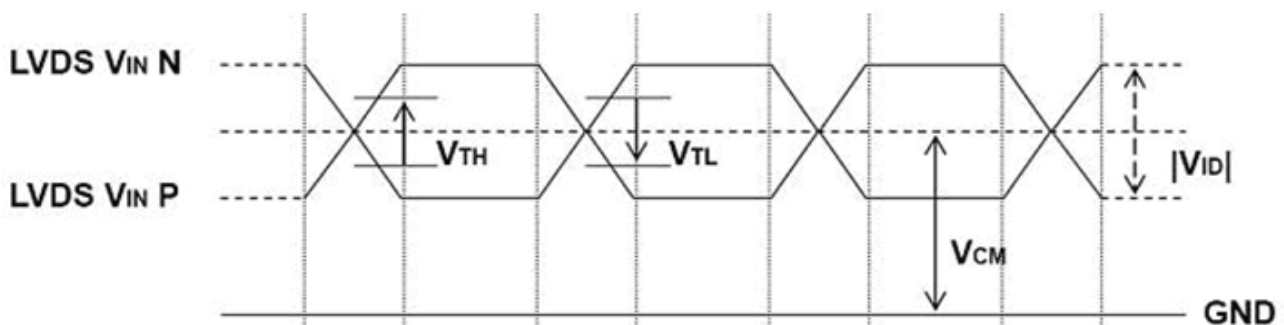
## 5.1.2 Signal Electrical Characteristics

(1) DC Characteristics of each signal are as following:

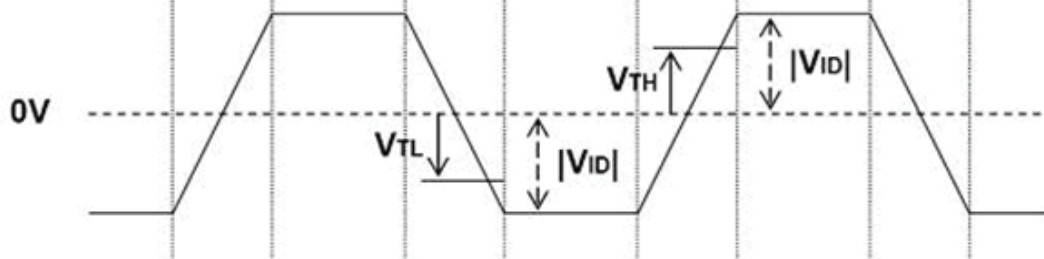
| Symbol     | Description                            | Min  | Typ  | Max  | Units | Conditions                                     |
|------------|----------------------------------------|------|------|------|-------|------------------------------------------------|
| $V_{TH}$   | Differential Input High Threshold      | -    | +50  | +100 | [mV]  | $V_{CM} = 1.2V$<br><b>Note 1</b>               |
| $V_{TL}$   | Differential Input Low Threshold       | -100 | -50  | -    | [mV]  | $V_{CM} = 1.2V$<br><b>Note 1</b>               |
| $ V_{ID} $ | Input Differential Voltage             | 100  | -    | 600  | [mV]  | <b>Note 1</b>                                  |
| $V_{CM}$   | Differential Input Common Mode Voltage | +1.0 | +1.2 | +1.5 | [V]   | $V_{TH}-V_{TL} = 200MV$ (max)<br><b>Note 1</b> |

**Note 1:** LVDS Signal Waveform

### Single-End



### Differential Signal





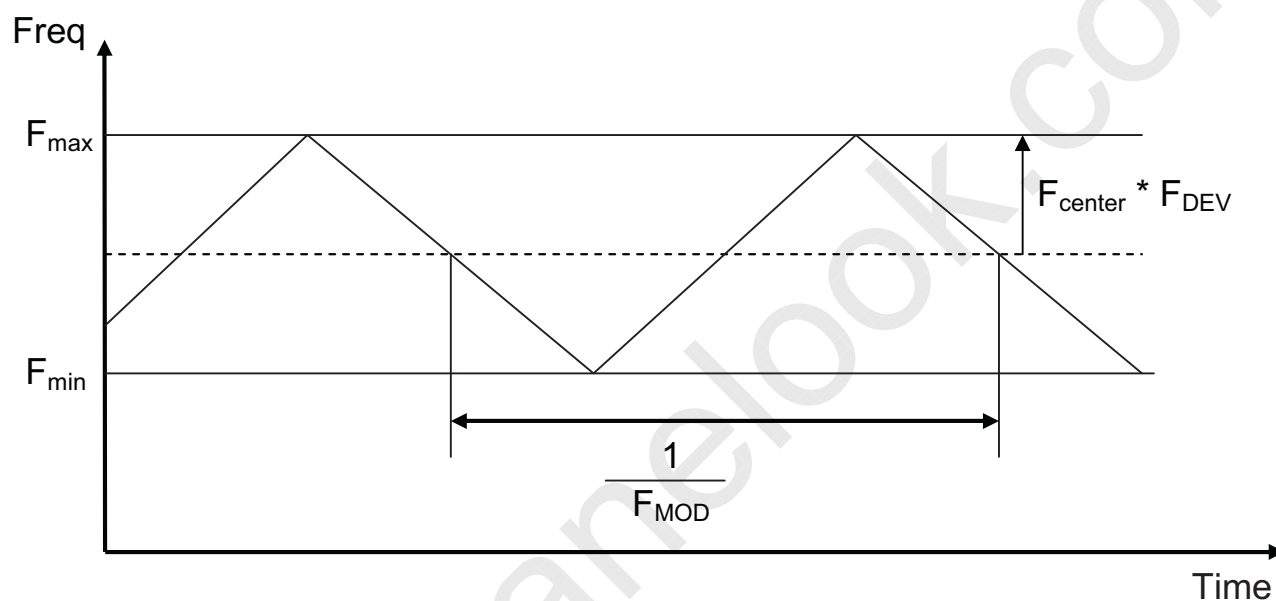
## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### (2) AC Characteristics

| Symbol    | Description                                            | Min | Max     | Units | Conditions |
|-----------|--------------------------------------------------------|-----|---------|-------|------------|
| $F_{DEV}$ | Maximum deviation of input clock frequency during SSC  | -   | $\pm 3$ | %     |            |
| $F_{MOD}$ | Maximum modulation frequency of input clock during SSC | -   | 300     | KHz   |            |



&lt; Spread Spectrum &gt;





# Product Specification

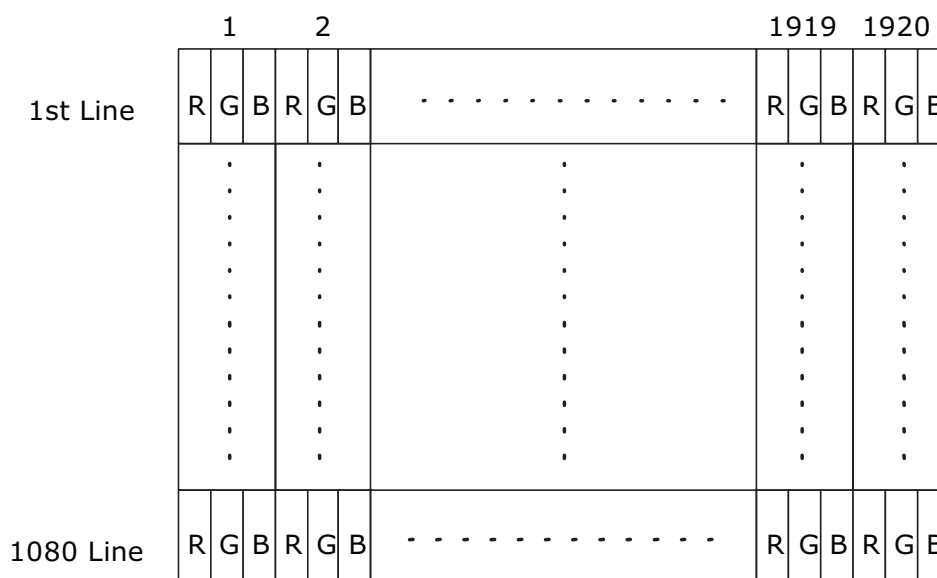
M240HTN01.0

AU OPTRONICS CORPORATION

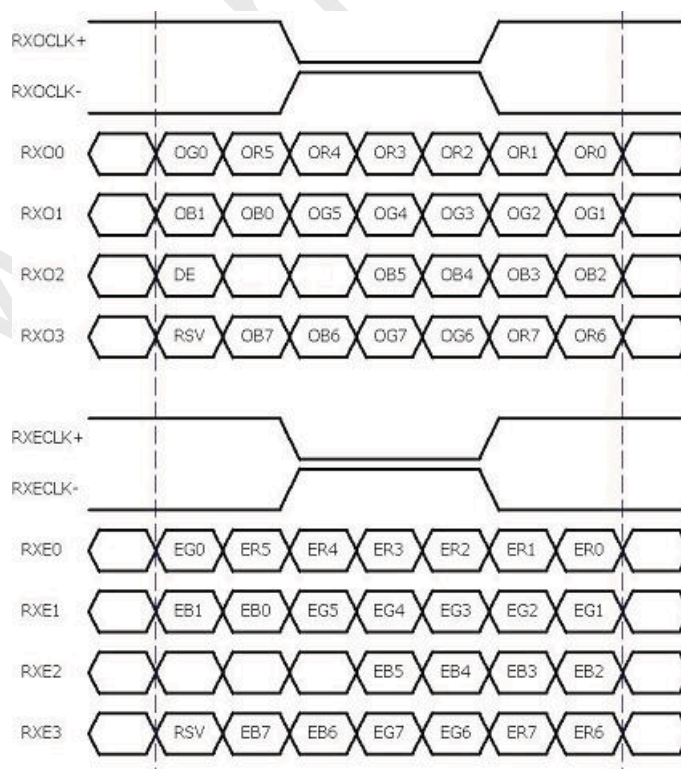
## 6 Signal Characteristics

### 6.1 Pixel Format Definition

Following figure shows the relationship between the input signals and LCD pixel format.



### 6.2 Input Data Format Definition



**Note 1:** R/G/B data 7:MSB, R/G/B data 0:LSB O = "Odd Pixel Data" E = "Even Pixel Data"





## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### 6.3 Signal Description

| PIN # | SIGNAL NAME | DESCRIPTION                                              |
|-------|-------------|----------------------------------------------------------|
| 1     | RxOIN0-     | Negative LVDS differential data input (Odd data)         |
| 2     | RxOIN0+     | Positive LVDS differential data input (Odd data)         |
| 3     | RxOIN1-     | Negative LVDS differential data input (Odd data)         |
| 4     | RxOIN1+     | Positive LVDS differential data input (Odd data)         |
| 5     | RxOIN2-     | Negative LVDS differential data input (Odd data, DSPTMG) |
| 6     | RxOIN2+     | Positive LVDS differential data input (Odd data, DSPTMG) |
| 7     | GND         | Power Ground                                             |
| 8     | RxOCLK-     | Negative LVDS differential clock input (Odd clock)       |
| 9     | RxOCLK+     | Positive LVDS differential clock input (Odd clock)       |
| 10    | RxOIN3-     | Negative LVDS differential data input (Odd data)         |
| 11    | RxOIN3+     | Positive LVDS differential data input (Odd data)         |
| 12    | RxEIN0-     | Negative LVDS differential data input (Even data)        |
| 13    | RxEIN0+     | Positive LVDS differential data input (Even data)        |
| 14    | GND         | Power Ground                                             |
| 15    | RxEIN1-     | Negative LVDS differential data input (Even data)        |
| 16    | RxEIN1+     | Positive LVDS differential data input (Even data)        |
| 17    | GND         | Power Ground                                             |
| 18    | RxEIN2-     | Negative LVDS differential data input (Even data)        |
| 19    | RxEIN2+     | Positive LVDS differential data input (Even data)        |
| 20    | RxECLK-     | Negative LVDS differential clock input (Even clock)      |
| 21    | RxECLK+     | Positive LVDS differential clock input (Even clock)      |
| 22    | RxEIN3-     | Negative LVDS differential data input (Even data)        |
| 23    | RxEIN3+     | Positive LVDS differential data input (Even data)        |
| 24    | GND         | Power Ground                                             |
| 25    | NC          | No connection (for AUO test only. Do not connect)        |
| 26    | NC          | No connection (for AUO test only. Do not connect)        |
| 27    | NC          | No connection (for AUO test only. Do not connect)        |
| 28    | VDD         | Power +5V                                                |
| 29    | VDD         | Power +5V                                                |
| 30    | VDD         | Power +5V                                                |

**Note 1:** Input signals of odd and even clock shall be the same timing.



# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

OPEN CELL layout

## 6.4 Timing Characteristics

The input signal timing specifications are shown as the following table

| Signal             | Item            | Symbol                        | Min  | Typ  | Max  | Unit |
|--------------------|-----------------|-------------------------------|------|------|------|------|
| Vertical Section   | Period          | $T_v$                         | 1088 | 1120 | 2047 | Th   |
|                    | Active          | $T_{disp(v)}$                 | 1080 | 1080 | 1080 | Th   |
|                    | Blanking        | $T_{bp(v)}+T_{fp(v)}+PW_{vs}$ | 8    | 40   | 967  | Th   |
| Horizontal Section | Period          | $T_h$                         | 1034 | 1060 | 1034 | Tclk |
|                    | Active          | $T_{disp(h)}$                 | 960  | 960  | 960  | Tclk |
|                    | Blanking        | $T_{bp(h)}+T_{fp(h)}+PW_{hs}$ | 74   | 100  | 74   | Tclk |
| Clock              | Period          | Tclk                          | 25   | 13.3 | 11.1 | Ns   |
|                    | Frequency       | Freq                          | 40   | 75   | 94   | MHz  |
| Frame rate         | Frame rate      | $V_{Freq}$                    | 50   | 60   | 75   | Hz   |
| Hsync Frequency    | Hsync Frequency | HFreq                         | 55   | 68   | 91   | KHz  |

**Note 1:** DE mode o

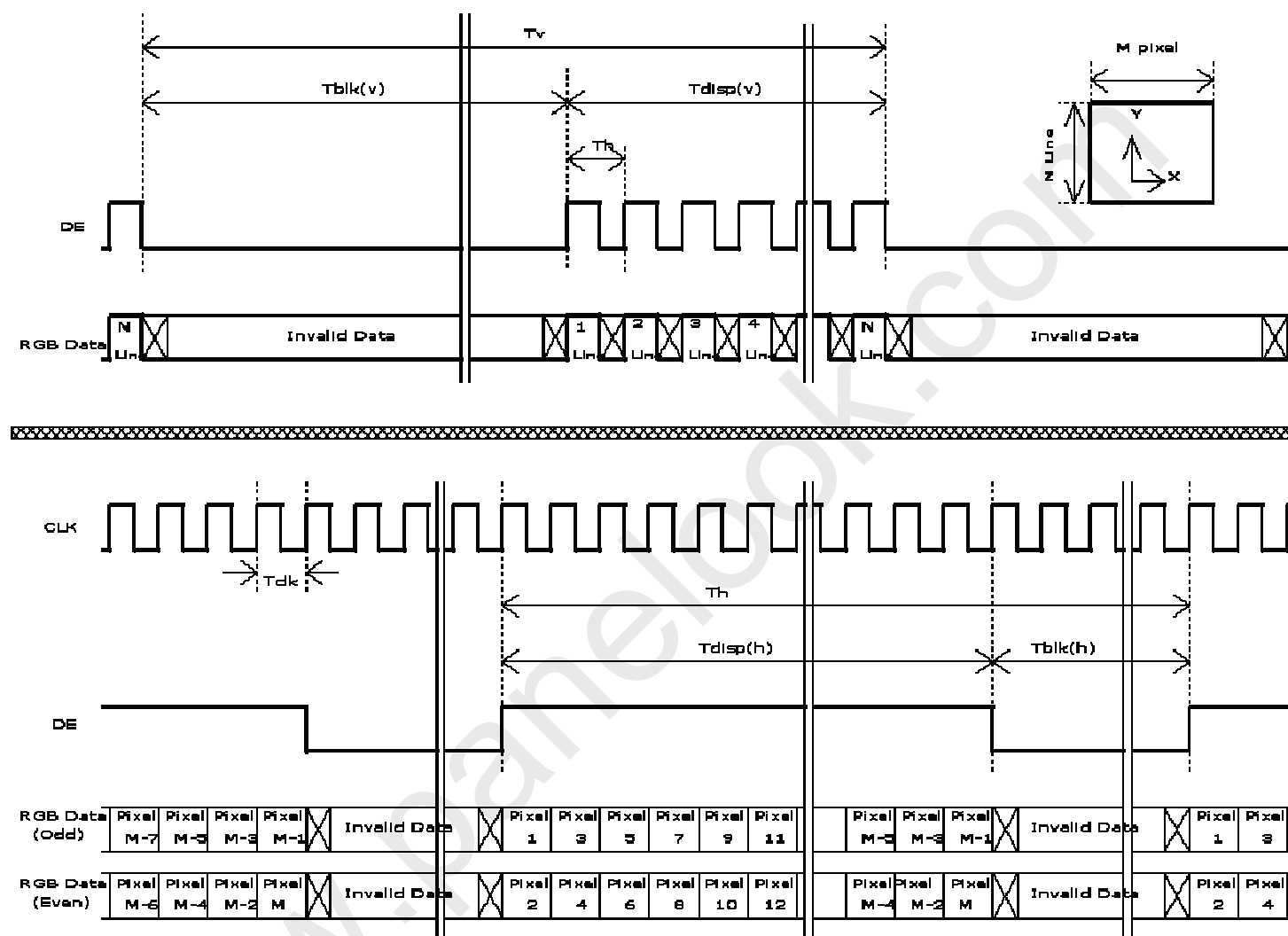


# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## 6.5 Timing Diagram





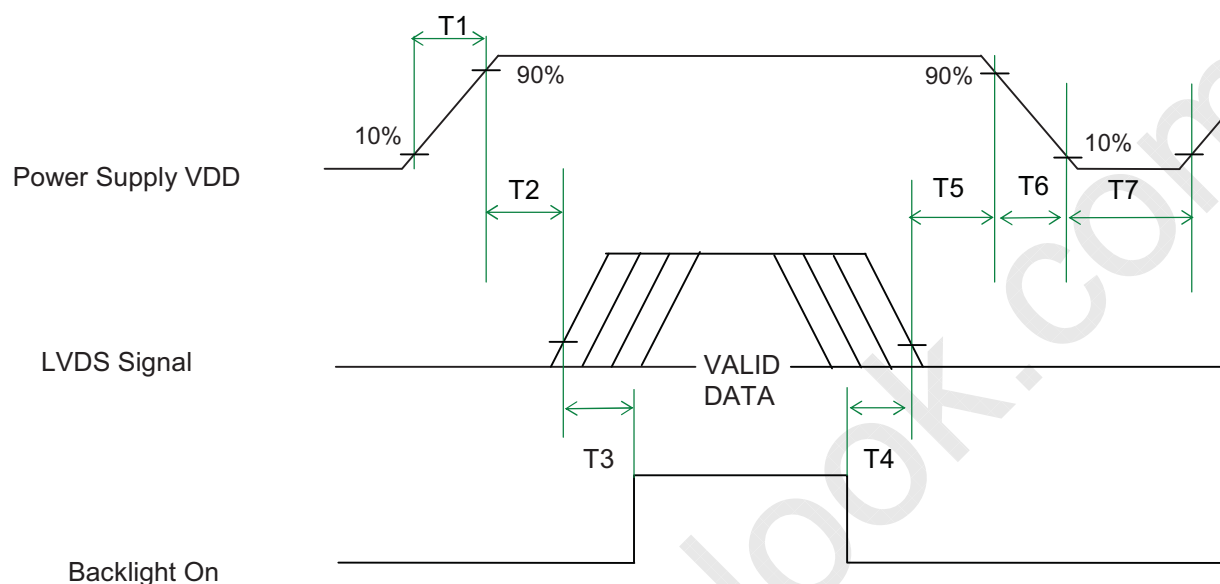
## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### 6.6 Power ON/OFF Sequence

VDD power and lamp on/off sequence are as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state when VDD is off.



Power Sequence Timing

| Parameter | Value |      |      | Unit            |
|-----------|-------|------|------|-----------------|
|           | Min.  | Typ. | Max. |                 |
| T1        | 0.5   | -    | 10   | [ms]            |
| T2        | 0     | -    | 50   | [ms]            |
| T3        | 500   | -    | -    | [ms]            |
| T4        | 200   | -    | -    | [ms]            |
| T5        | 40    | -    | -    | [ms]<br>Note1,2 |
| T6        | 5     | -    | 100  | [ms]<br>Note1,2 |
| T7        | 1000  | -    | -    | [ms]            |

**Note1** : Recommend setting T5 = 0ms to avoid electronic noise when VDD is off.

**Note2** : During T5 and T6 period , please keep the level of input LVDS signals with Hi-Z state.



# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## 7 Connector and Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

### 7.1 TFT LCD Module

| Connector Name / Designation | Interface Connector / Interface Card           |
|------------------------------|------------------------------------------------|
| Manufacturer                 | P-TWO<br>STM                                   |
| Type Part Number             | MSCKT2407P30HB (STM)<br>AL230F-A0G1D-P (P-TWO) |
| Mating Housing Part Number   | FI-X30HL (Locked Type)                         |

#### 7.1.1 Pin Assignment

| Pin# | Signal Name                            | Pin# | Signal Name                            |
|------|----------------------------------------|------|----------------------------------------|
| 1    | RxOIN0-                                | 2    | RxOIN0+                                |
| 3    | RxOIN1-                                | 4    | RxOIN1+                                |
| 5    | RxOIN2-                                | 6    | RxOIN2+                                |
| 7    | GND                                    | 8    | RxOCLKIN-                              |
| 9    | RxOCLKIN+                              | 10   | RxOIN3-                                |
| 11   | RxOIN3+                                | 12   | RxEIN0-                                |
| 13   | RxEIN0+                                | 14   | GND                                    |
| 15   | RxEIN1-                                | 16   | RxEIN1+                                |
| 17   | GND                                    | 18   | RxEIN2-                                |
| 19   | RxEIN2+                                | 20   | RxECLKIN-                              |
| 21   | RxECLKIN+                              | 22   | RxEIN3-                                |
| 23   | RxEIN3+                                | 24   | GND                                    |
| 25   | NC (for AUO test only. Do not connect) | 26   | NC (for AUO test only. Do not connect) |
| 27   | NC (for AUO test only. Do not connect) | 28   | VDD                                    |
| 29   | VDD                                    | 30   | VDD                                    |



## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### 8 Reliability Test

Environment test conditions are listed as following table.

| Items                             | Required Condition                                                                                                             | Note          |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---------------|
| Temperature Humidity Bias (THB)   | Ta= 50°C, 80%RH, 300 hours                                                                                                     |               |
| High Temperature Operation (HTO)  | Ta= 50°C, 50%RH, 300 hours                                                                                                     |               |
| Low Temperature Operation (LTO)   | Ta= 0°C, 300 hours                                                                                                             |               |
| High Temperature Storage (HTS)    | Ta= 60°C, 300 hours                                                                                                            |               |
| Low Temperature Storage (LTS)     | Ta= -20°C, 300 hours                                                                                                           |               |
| Vibration Test<br>(Non-operation) | Acceleration: 1.5 Grms<br>Wave: Random<br>Frequency: 10 - 200 Hz<br>Duration: 30 Minutes each Axis (X, Y, Z)                   |               |
| Shock Test<br>(Non-operation)     | Acceleration: 50 G<br>Wave: Half-sine<br>Active Time: 20 ms<br>Direction: $\pm X$ , $\pm Y$ , $\pm Z$ (one time for each Axis) |               |
| Drop Test                         | Height: 46 cm, package test                                                                                                    |               |
| Thermal Shock Test (TST)          | -20°C/30min, 60°C/30min, 100 cycles                                                                                            | <b>Note 1</b> |
| On/Off Test                       | On/10sec, Off/10sec, 30,000 cycles                                                                                             |               |
| ESD (Electro Static Discharge)    | Contact Discharge: $\pm 15KV$ , 150pF(330 $\Omega$ ) 1sec,<br>15 points, 25 times/ point                                       | <b>Note 2</b> |
|                                   | Air Discharge: $\pm 15KV$ , 150pF(330 $\Omega$ ) 1sec<br>15 points, 25 times/ point                                            |               |
| Altitude Test                     | Operation: 18,000 ft                                                                                                           |               |
|                                   | Non-Operation: 40,000 ft                                                                                                       |               |

**Note 1:** The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20°C to 60°C, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

**Note 2:** EN61000-4-2, ESD class B: Certain performance degradation allowed:

- No data lost
- Self-recoverable
- No hardware failures



## Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

### 9 Mechanical Characteristics





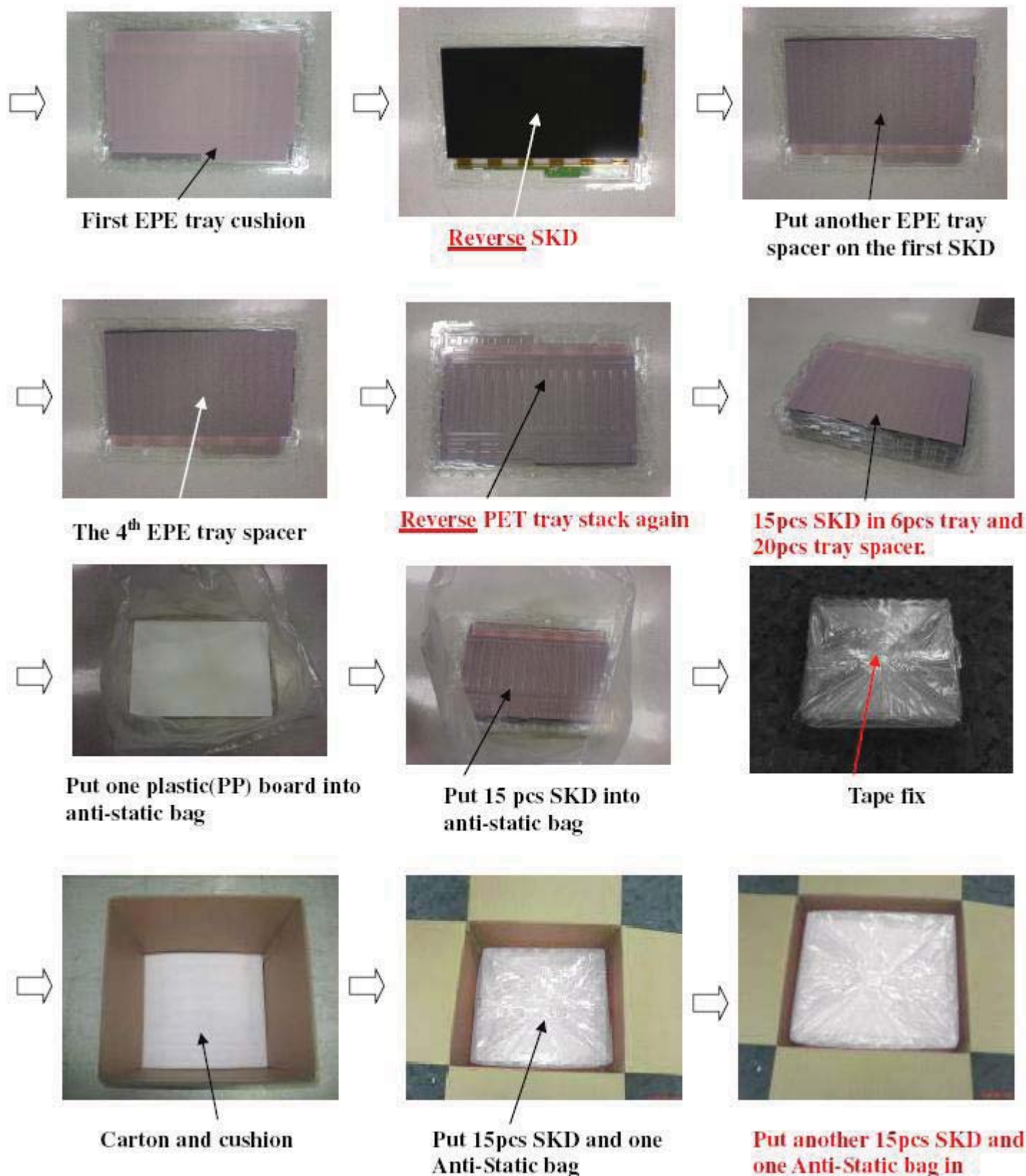
# Product Specification

M240HTN01.0

AU OPTRONICS CORPORATION

## 10 Packing Specification

### 10.1 Packing Flow

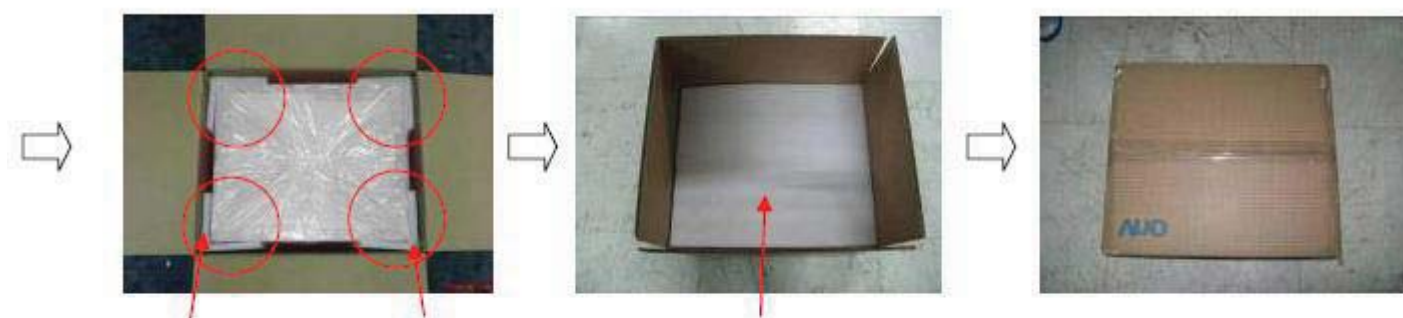




## Product Specification

M240HTN01.0

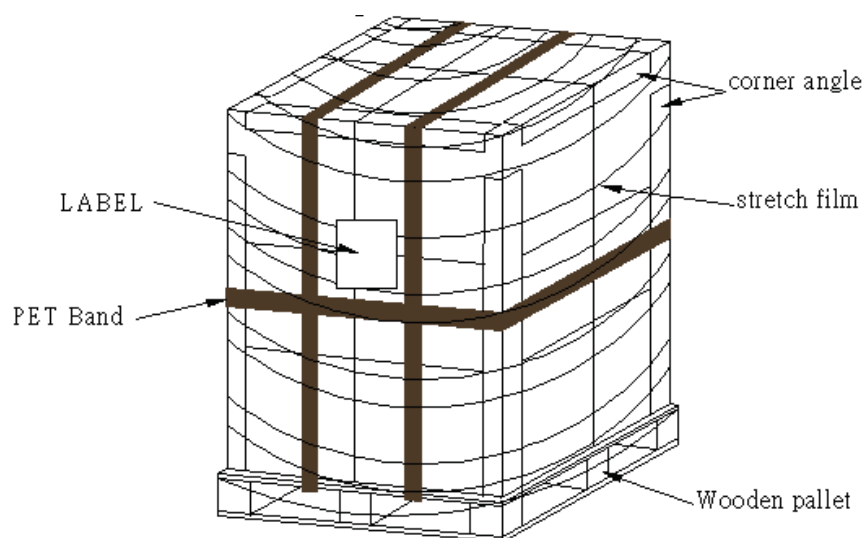
AU OPTRONICS CORPORATION



Carton and carton cushion

Put carton cushion at the top

Tape (H type)



### 10.2 Pallet and Shipment Information

|   | Item                 | Specification     |                                    |            | Remark                            |
|---|----------------------|-------------------|------------------------------------|------------|-----------------------------------|
|   |                      | Q'ty              | Dimension                          | Weight(kg) |                                   |
| 1 | Panel                | 1                 | 546.8(H)mm x 313.5(V)mm x 1.5(D)mm | 0.514      | Note 1                            |
| 2 | Cushion              | 1                 | --                                 | 6.86       |                                   |
| 3 | Box                  | 1                 | 687(L)mm x 502(W)mm x 358(H)mm     | 1.9        | without Panel & cushion<br>Note 1 |
| 4 | Packing Box          | 30 pcs/Box        | 687(L)mm x 502(W)mm x 358(H)mm     | 24.18      | with panel & cushion<br>Note 1    |
| 5 | Pallet               | 1                 | 1060(L)mm x 740(W)mm x 138(H)mm    | 12         | Note 1                            |
| 6 | Pallet after Packing | 8<br>boxes/pallet | 1060(L)mm x 740(W)mm x 1570(H)mm   | 205.4      | Note 1                            |

**Note 1:** Estimated value which is subject to change based on real measured data.